provide cheap water transit to Ernakulam, Cochin and other commercial centres;

(b) whether any reports on this matter have been received by the Government from the Chief Engineer and the Registrar of Village Panchayats; and if so, will copies of these reports be placed on the table;

(c) what action the Government have so far taken on these petitions;

(d) what reply they have given to each of these petitions?

Mr. V. K. Aravindaksha Menon.—(a) Yes.

(b) Yes; copies of the Chief Engineer's reports, dated 30th October 1931 and 8th July 1932, C. No. 2872/06, and a copy of the Registrar of Village Panchayats' report, dated 20th January 1932, A. 1244/07, are placed on the table. (*Appendix III* (1), (2) and (3).

(c) Government investigated the matter and found that the work could not be taken up owing to prohibitive cost.

(d) The petitioners were informed that the work of the canal cannot be taken up in view of the heavy cost involved.

Nemmara Irrigation Scheme.

445. Mr. K. G. Nayar.—Will the Government be pleased to state:—

(a) whether the preliminary investigations regarding the irrigation scheme at Nemmara are over;

(b) will the reports regarding those schemes and especially the Erumakayam Scheme be placed on the table;

(c) what final steps do the Government propose to take in the matter?

Mr. V. K. Aravindaksha Menon.—(a) Yes.

(b) The report regarding the Peranda and Pothundi diversion schemes is placed on the table. (*Appendix IV.*)

Regarding the Erumakayam Scheme the Member is referred to the answer given to question No. 217 in the Council Session, dated 3rd Kumbham 1108 (14th February 1933).

(c) The scheme will be finally considered when finances improve.

Pay of certain posts.

446. Mr. P. Raman Menon.—Will the Government be pleased to state:—

(a) what was the maximum pay of the following posts in the year when the maximum pay of the 1st grade Sub-Magistrate was fixed at Rs. 150;

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APPENDIX IV.

Report C. No. 1848/07 dated 7th July 1932, from the Chief Engineer.

Opening New Irrigation works—Nemmara Firka.

The original project was for the work of constructing a storage reservoir with earthen dam at Pothundy for the benefit of the entire wet cultivation in the Nemmara Firka, Chittur Taluk. After repeated trials, the line of the dam was finally fixed just below the confluence of the two streams near Pothundy temple. It includes distributory works also. The amount of the estimate is Rs. 9,55,000.

2. The storage was fixed with a view to make the best use of the run-off from the catchment which will be available for being impounded in years of ordinary rainfall. The water so impounded will be let out through distributory works for irrigating the lands in the Firka. As the ayacut will have the benefit of the falling rains during the South-west and North-east monsoons, supply will have to be drawn from the reservoir only when the falling rains are insufficient or when there is no rainfall in the locality. The size of the reservoir is fixed to give only this supply.

3. The works proposed consist of an earthen dam faced with granite dry pitching on the water side, a waster weir, outlet sluice and distributory works. The reservoir proper will cost about Rs. 7,37,500 and the distributories about Rs. 2,17,500.

4. The sub-joined table exhibits the general sections which have been given to the dam in the different portions, the sections varying according to the height.

Serial No.	Height of dam above G. L.	Height of dam above M. W. L.	Top width of dam	Upstream slope	Downstream slope	Remarks
1	15 feet and Under	5'—0"	6'—0"	2 —1	1½—1	
2	15'—25'	6'—0"	6'—"0	2½—1	2 —1	
3	25'—50'	6'—0"	8'—0"	3 —1	2 —1	
4	Above 50'	7'—0"	10'—0"	3 —1	2 —1	

5. There are 1788 acres of single crop wet lands and 4625 acres of double crop wet lands fetching an annual land revenue of Rs. 28,132 to the Government. These now depend only on the falling rains and have no means of irrigation supply. The proposed works will, besides ensuring regular irrigation supply to these lands, bring under wet cultivation an additional ayacut as shown below.

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a. 1288 acres of existing dry lands can be converted into single crop wet.

b. 976 acres of existing dry lands can be converted into double crop wet.

c. 20 acres of poramboke lands can be converted into single crop wet.

d. 21 acres of poramboke lands can be converted in to double crop wet.

e. 138 acres of reserve forest lands can be converted into single crop wet.

f. 33 acres of reserve forest lands can be converted into double crop wet.

g. 1758 acres of existing single crop lands can be converted into double crop wet

h. 239 acres of garden lands can be irrigated.

It is expected that after meeting the demands of all lands in the State that could be commanded by the proposed works, there will be surplus storage which might be given to the adjoining British lands to an extent of about 600 acres and 'neervarom' collected in respect of same.

6. The Revenue side of the question has not yet been enquired into in detail. If the scheme is to be sanctioned, the work must be rendered productive and for this, the interested landowners should come forward offering to pay to the Government sufficient rates in return for the irrigation supply. At least 6% on the capital cost excluding all charges should be forthcoming. Arrangements may kindly be made through the Revenue or Panchayat Department to move the interested people in this behalf.

7. The general body of the land-owners who may be benefited by the scheme is expected to co-operate with the Government in the extension of irrigation facilities, though there continues to be opposition headed by a few selfish people who by loosing some of their lands by submergence or otherwise will have no material corresponding benefit accruing to them on account of the works.

8. The real solution for overcoming the terrible handicap caused by want of an irrigation supply will be to carry out the original project in its entirety. The whole scheme has been thoroughly investigated in the first instance, all surveys and levels have been taken and all data collected. Only minor alterations here and there may be required now in the original estimate. Rates also will have to be revised. R. C. work may with advantage be introduced in suitable situations. The lands, improvements, etc., that will have to be taken up for the work

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will have to be revalued on account of change of conditions subsequent to the submission of the original project estimate by the Special Irrigation Investigation Party. The lines of the dam and the distributory works will have to be verified at spot with a view to note alterations in condition that might have been brought about during the last decade, etc. But all these may not substantially alter the cost of the works. The financial side of the question may be first arranged to be enquired into before any work is attempted to be done towards the revision of the original project estimate.

9. But as funds for such big and costly works may not now be available on account of the financial stringency, the present proposal may be confined to cheaper diversion works and open out anicut systems from the Pothundy and Peranda rivers as we have now from the Chittur river and also similar to the private irrigation systems in the Korayar, Varattar and Velanthavalam rivers of the Chittur Taluk. By the proposed works water that is now running to waste may be utilised for the purpose of irrigating not only the existing viruppu and mundakan lands, but also additional lands, by converting the existing single crop wet lands into double crop wet lands, and existing dry lands whose levels will allow them to be converted into double crop wet lands.

10. The diversion weirs will raise the levels of water in the two rivers so that water may be diverted into supply channels on levels higher than the rivers for the benefit of lands which have at present either no supply or precarious supply. The sites selected for such diversion anicuts across the Pothundy and Peranda rivers which are the only streams in the Firka, are ideal ones with rocky bed and with depressions to allow of easy flood discharge. They have tolerable high banks. The slope of the country and the streams render it easy to make canals to the irrigable lands through the shortest diversion lines. The reaches of the rivers in these localities are straight and so the velocity is expected to be uniform and the sectional areas of the streams will be fairly constant. The streams are likely to have direct sweeps past the works thus reducing the deposition of silt in front of the regulating shutters to a minimum. The crest levels will be 3% above the P. S. L.s' of the off-takes. Close weirs with pucca body walls right across the rivers are not now proposed to be constructed. Only open weirs with abutments and intermediate piers with pin shutter arrangements for regulation will be designed so as to get openings for the full height throughout. This arrangement will dispense with the necessity for undersluices to prevent the silting up of the river beds at the heads of the off-take channels. These will interfere little with

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the normal action of the streams. During floods, the shutters can be easily raised, leaving little obstruction to the channels of the streams and thus not interfering with the discharging capacities of the rivers. The chances of undue rising of floods above the anicut will be little as the major portion of the length of the weirs will be made removable.

11. Off-take canals: These will be carried at sufficiently high levels to ensure sufficient fall from them to irrigate lands for some distance. The necessity for irrigating during the monsoons will be trifling. The average supplies in the rivers are likely to be in excess of the minimum supplies. It will not be advisable to base the capacity of the canals on the average supplies as their duration will be small, but a discharging power moderately in excess of the minimum will be provided for.

12. The ayacut under each of the systems has been roughly taken as 750 acres, inclusive of existing dry lands proposed to be converted into double wet, existing single crop lands to be converted into double wet, and existing double crop lands, proposed to be benefited by the schemes. Duty for continuous full flow may be taken as 40. Water required for each channel will therefore be 750/40 or 18¾ cusecs. As water will, however, have to be carried in large quantities when available in short durations of individual freshets in the rivers during the Mundakan season for storing in the fields themselves for tanks that exist or that may be constructed by the interested people, discharge has been taken as 36½ cubic feet, i. e., nearly twice the above.

13. Taking the depth of flow as 2½' the section of the channel required would be 5'-0 bottom width, side slopes of cutting 1 to 1 and bedfall, 4' per mile. The resulting discharge would be 36½ cusecs and the velocity would be 1·94 per second. It will be quite suitable for the sill traversed without causing deposit of silt or scours. The gradient will be less than the fall of the surrounding country and so the channels will have easy command of the areas contemplated to be benefited. In times of freshets with no simultaneous local rainfall, the canals could be worked at maximum water level which may be taken as 6" above the full supply level and in this case the discharge would be 52 cusecs and the velocity 2·18 feet per second. This will facilitate drawing quickly the available supply in the river in individual freshets of short duration so that it may be used for direct irrigation and for filling in tanks, etc. The cheapest routes for the canals have been fixed by means of trials and the most advantageous lines adopted. The points of canals traced

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on the ground with the levelling instrument will be such that the surface of water when running full will be on the average about 6" above the ground level.

14. The catchment area of the Pothundy river at the site selected for the diversion weir will be 14·25 square miles and that of the Peranda river will be 7 square miles.

15. Pothundy river diversion weir: The site here is rocky bed in poramboke survey number 535 of Pothundy village between Survey number 493 on the right and survey number 584 on the left. The anicut will be of the description alluded to already. The off-take channel will be from the left side of the river with the necessary Head Sluice, etc. The canal will run in the village of Pothundy for a length of about 5,000 feet and in the village of Nemmara for a length of about 7,900 feet. The total length will be about 2½ miles. Its ayacut is expected to be as shown below.

a. 150 acres of dry lands that can be converted into double crop wet.

b. 250 acres of existing single crop lands that can be converted into double wet.

c. Besides the above it will benefit more than 350 acres of existing double crop lands.

Allowing Rs. 7—8—0 per acre for (a) and Rs. 1—4—0 for (b) and (c) the probable additional revenue that may be expected would be about Rs. 1,875. Against this the recurring annual expenditure will be as follows:—

Two watchmen on Rs. 10 for 12 months	Rs. 240
Annual maintenance	Rs. 350

Due to acquisition of wet and dry lands for purposes of the work, abatement of land revenue on acres that may be occupied by the works should be allowed and this may come to about Rs. 35. The net additional revenue on account of the works will therefore be about Rs. 1,250. The cost of the scheme will approximately be as shown below:—

	Rs.
Earth work inclusive of rock blasting	7,500
Culverts across road	1,000
Head-works	3,500
Cross drainage works	3,000
Land acquisition charges	4,500
Sundries	1,000
Total	20,500

The net return will thus be 1250/205 or 6 per cent the least.

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16. Peranda river diversion weir: Here also the site is rocky bed in poramboke Survery No. 824 of Thiruvazhiyad Village between Survey No. 825 on the left and Survey No. 663 on the right. This will be an open weir as described already. The off-take channel will be from the right margin with the necessary Head Sluice etc. The canal will run in Thiruvazhiyad Village for a length of about 11½ furlongs and the remaining distance will be in the Village of Keradi. The total length of the canal will be about 2½ miles.

Its ayacut will be as shown hereunder:

130 acres of dry lands that can be converted into double wet.

270 acres of existing single crop lands that can be converted into double crop wet.

350 acres of existing double crop wet lands that will have the benefit of regular irrigation supply.

Allowing the same rates as in the case of the ayacuts under the proposed Pothundy river diversion weir scheme referred to in para 15 above, the probable additional revenue that may be expected would be about Rs. 1750.

The annual recurring expenditure will be as follows:—

	Rs.
Two watchmen on Rs. 10 for 12 months	240
Annual maintenance	335
Abatement of land revenue	25
Total	600

The net additional revenue will thus be Rs. 1,150.

The cost of the scheme will approximately be as shown below:—

	Rs.
Earth work	7,000
Culverts	1,500
Head-works	3,500
Cross drainage works	2,000
Land acquisition charges	4,000
Sundry works	1,000
Total	19,000

The net return will thus be 1150/190 or 6 per cent interest.

17. The foregoing paragraphs will show that both the works will be productive and there is sufficient scope for expansion of such irrigation. If, after executing the above works, it is found that the rivers contain any supply to spare then the canals may be extended and further additional lands brought under irrigation in course of time.

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18. These works will not at all interfere with the watering of the garden lands that is now done by the interested people by putting up temporary earthen chiras adjoining their gardens and by baling out water therefrom, as these chiras are generally put up only after the Mundakan season is over and as no cultivation of wet lands after this is contemplated in the schemes.

19. The out-door work in connection with the schemes is over and detailed plans and estimates will be prepared and submitted for sanction in due course. I have also made necessary part provision for these two works in my budget proposals for the next year which may be kindly retained and sanctioned.

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